TECHNOLOGY

Atomic Desalting Costly

➤ THE POWER of the atom to draw salt from the ocean and give man valuable fresh water is practical today only in plants operating on a large scale.

Small desalination plants powered with atomic energy for generating electricity and desalting water just cannot compete with plants using conventional fossil fuels, such as coal and oil, said Gordon F. Leitner of Aqua-Chem, Inc., Waukesha, Wis.

Even in relatively high-cost fuel areas such as Key West, Fla., and Long Island, N.Y., a nuclear-powered plant would have to produce at least 50 megawatts of power and 10 million gallons of water per day before the costs would be competitive with plants using fossil fuel, Mr. Leitner told members of the First International Desalination Symposium in Washington, D.C.

The most popular of the four fuel sources available today is fuel oil, burned either in a steam boiler to provide steam or as fuel for diesel engines that drive the compressors for certain desalting units. Natural gas is also used as a fuel for operating steam boilers and for use in natural gas engines. Coal is the third source, and nuclear energy the fourth.

The world's first land-based desalting plant to use nuclear energy for power operates at the U.S. base at McMurdo Sound in the Antarctica, Mr. Leitner noted. This relatively small plant, which generates power and produces 14,400 gallons of fresh water per day, uses atomic energy instead of other fuels mainly because the cost of fuel oil delivered to the frigid area is enormously expensive—sometimes more than $10 per gallon.

However, in smaller plants built in less severe climates, nuclear energy cannot compete with ordinary fuel.

Current water shortages in New York, New Jersey and the northeastern part of the United States emphasize the need for the construction of large plants.

At the same time, there is a continuing, perhaps more immediate need throughout the world for plants in the small- to medium-size range with capacities ranging from five thousand to five million gallons per day. These plants, some of which are now operating over a wide geographical area, must take into consideration different operating cycles and plant designs patterned to fit the availability of the source of fuel, the space allotted to the plant, the availability of water to be processed and the cost of the treatment.

Extensive coastal deserts exhibit the greatest need for desalination to provide man with vital fresh water, Mr. Perevil Meigs, chairman of the Arid Zone Commission of the International Geographical Union in Wayland, Mass., told the symposium.

One advantage of coastal deserts is an unlimited supply of salt water at sea level that can be pumped to the desalination plant at relatively low cost. Equipment for the plant, as well as fuel and other supplies can be easily and economically supplied by ships.

Power to run desalination plants in these areas could be supplied from conventional fuels such as oil, gas or coal, or from nuclear energy. Solar radiation could also be used to draw fresh water from the sea, and even tides and waves constitute a potential source of power for sunlit coastal deserts.

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BIOTECHNOLOGY

Computer Spots Disease

➤ AN ELECTRONIC COMPUTER has left a team of doctors far behind in its ability to spot heart ailments by reading electrocardiograms.

Electrocardiograms are graphs showing the pattern of electric signals generated by the heart.

The computer, which can analyze a single graph in about 15 seconds, identified 81% of a known group of electrocardiograms as abnormal patterns. The heart specialists, however, with no information but the electrocardiograms, detected only 54%.

The computer system was designed by a Stanford University graduate student, Donald F. Specht, who is working for the Lockheed Missiles and Space Company while studying for his doctorate.

The system could enable mass-production "heart wagons," similar to mobile chest X-ray units. High-speed, mechanical diagnosis would permit rapid screening of large groups of people for possible heart trouble.

If the technique can be speeded up even further, it might be used to keep continuous watch on a patient's heart condition during surgery. Besides being more accurate than a human observer, the computer might be quicker at spotting malfunctions.

The system, built around an International Business Machines Corporation 360 computer, actually "reads" the electrocardiograms, using a technique called pattern recognition. Similar techniques have been used in the past to design devices than can read symbols, numbers and even handwritten letters.

Mr. Specht's computer program is general enough to be applied to other pattern recognition problems, such as automated reconnaissance systems, for which a computer might conceivably be designed to actually recognize terrain features and even buildings from aerial observations.

The system is likely to find its first use watching over astronauts both in space and in earthbound flight simulators.

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GENERAL SCIENCE

Japan Plans to Reopen South Pole Station

➤ FOR THE FIRST TIME in four years, Japanese scientists will reopen their research station Showa this winter in Antarctica.

Headed by Dr. Masayoshi Murayama, the expedition will include 23 field workers and another 17 who will spend the winter at the station, which is located in Queen Maud's land, south of the tip of Africa. Although the station was closed in February 1962, Japanese scientists have continued their field work partly as guests of the U.S. Antarctic Research Program at McMurdo Station, according to the National Science Foundation.

The expedition will leave Japan Nov. 20 on a newly constructed icebreaker, the Fuji, and return in March. Scientific research at the South Pole is much more active during the coming winter months, when the sun brings summer to the Southern Hemisphere.

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TECHNOLOGY

Wood-Plastic Composite To Be Tested, Evaluated

➤ ANOTHER EVIDENCE of the peaceful use of the atom may soon be found in salad bowls, table tops, gavels and a variety of other wood products.

The use of atomic power to produce a better wood is coming closer to reality with the selection of 78 wood product companies for participation in a program sponsored by the U.S. Atomic Energy Commission for producing wood-plastic material by ionizing radiation.

Wood samples submitted by these companies, selected from among 180 interested firms, will be custom processed into new wood-plastic composites by the Lockheed-Georgia Company of Dawsonville, Ga., under the auspices of AEC, and will be tested and evaluated by the companies.

The wood-plastic combination is produced by a process developed at West Virginia University under the direction of Dr. J. A. Kent.

In the technique, wood is first impregnated with a liquid plastic monomer and then bombarded with radiation from a source such as cobalt 60.

When exposed to such radiation, the monomers, or single molecules, of the liquid plastic become linked with each other to form giant molecules, or become polymerized.

These long-chain macro-molecules are essentially a plastic, and thus a plastic-permeated wood is created. The result is a solid plastic-reinforced wood that is stronger and harder than ordinary wood, but still retains its natural beauty.

The process has great potential since different qualities in the wood-plastic combination can be obtained by varying the plastic monomer used for impregnating the wood. Color can also be added to the liquid during impregnation.

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